



CITY AND COUNTY OF DENVER

DEPARTMENT OF ENVIRONMENTAL HEALTH

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ENVIRONMENTAL PROTECTION
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Mayor

June 7, 1999

Ms. Bonnie Lavelle
U.S. EPA Region VIII
One Denver Place
999 18th Street, Suite 500
Denver, CO 80202-2405

RE: Residential Risk-Based Sampling, Stage I Investigation
Vasquez Boulevard/I-70 Site

Dear Ms. Lavelle:

We have received and reviewed a draft report titled Residential Risk-Based Sampling, Stage I Investigation, dated April 1999. We have the following comments:

1. The sampling effort is very helpful in evaluating contaminant patterns. We agree with many of the general conclusions contained in the report. Based on the data contained within this report, there appears to be a boundary effect along residential property lines; arsenic and lead appear to be co-located; and cadmium concentrations appear to be relatively low at yards with highly elevated arsenic concentrations.
2. It is important that these results be compared with previous sampling results from Phase I and II sampling, in order that the adequacy of those sampling efforts can be assessed. Comparisons of the target properties and adjacent properties risk-based sampling results with previous phases would be beneficial. It would be helpful to include a table with columns showing: the selected property identification number, previous grab sampling results, previous composite sampling results, and previous sampling results from adjacent properties. Additionally, the locations of previous samples from adjacent properties should be referenced. In addition, the values in Table A.1 should be sorted by property identifier in order that all samples from one property can be easily reviewed. These values would be helpful in evaluating whether the previous sampling methods adequately characterized soil

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concentrations and whether previous methods can be used to adequately characterize risk. Without a comparison between previous sample results and the Risk-Based Sampling, we can't evaluate whether previous sampling adequately characterized soil concentrations, reflects the likely range of concentrations expected on a property, or whether previous composite sampling identified or diluted significant "hot spots".

I attempted to prepare an example below. I'm uncertain regarding the accuracy of the example, as I needed to sort through four different reports and make assumptions regarding sample location identifiers, the locations of adjacent properties, whether values were composite or grab, and I didn't attempt to evaluate the data statistically. I wasn't sure that samples identified as Map 1 samples match the results shown for Location 1. I wasn't sure which of the adjacent properties shown on location 1 match up with the sample results listed for C4701EL and which match up with C4721TH. Map 1 C4711THB-052 shows an arsenic result of 4514 ppm, yet location 1 shows a maximum value of 3105 ppm and a mean of 895 ppm.. The results reported in the tables for the adjacent property show an arsenic range of 9-214 ppm, yet the map of adjacent properties show results exceeding 450 ppm on one adjacent property. I believe that the concerns regarding confidentiality of results can still be addressed while clearly providing sample and location identification such that relationships between sampling methods and sampling locations can be evaluated. These issues should be addressed and clarified in the final report.

Sample Location	Phase I/II Sampling Results		Removal Confirmatory Sampling		Risk-Based Sampling	
	Range	Comp/Grab	Range	Comp/Grab	Range	Avg
Location 1 C4711THB	220-1700	Grab	?	?	9-4514	895 ppm
L 1 Adjacent C4701EL	?				9-214	
L1 Adjacent C4721TH	?				9-800	

3. There appears to be some "spillover" of contamination from highly elevated yards into adjacent yards. Sample results taken from adjacent yards need to be compared with previous sampling results in order to evaluate whether grab or composite sampling techniques adequately captured the apparent "spillover" effect. The potential for "spillover" needs to be carefully evaluated and addressed in all future sampling plans. The extent of "spillover" needs to be identified in future sampling to evaluate whether additional characterization will be necessary in yards next to highly elevated yards, and whether limited remediation in yards adjacent to highly contaminated yards may be warranted.
4. In general, concentrations appear to decrease with depth. However, at some of the highly elevated properties, concentrations below one foot in depth are still elevated. Consideration should be given to additional depth-integrated sampling at highly elevated properties,

extending beyond one foot. Alternately, this issue will need to be addressed during the Feasibility Study when developing and evaluating remedial alternatives.

5. The text states, at page 2, that four arsenic concentration ranges were selected. However, the sample result mapping does not clearly indicate which property was represented by which interval. Sample locations 3 and 8 could represent the 200-400 ppm interval based on mean results. However, it is not clear whether the previous sampling results indicated this range of contaminants, or whether this property was selected to represent higher concentrations. Due to the extreme range of sample values, sample results for Location 3 and Location 8 clearly indicate the need for comparison between previous sampling results and intensive sampling results.
6. A statistical evaluation of co-location between arsenic and lead results would be helpful. For example, can arsenic concentrations be used as a reliable predictor for lead concentrations? Is there a reliable ratio between arsenic and lead concentrations? This information would be useful in evaluating potential sources of the contaminants.
7. We understand that these data are being used to develop future sampling plans. Assumptions and conclusions drawn from these data, as they are used in developing those plans, should be clearly explained. Statistical calculations and assumptions, including those regarding data distributional patterns, should be justified for each sample population (high, medium, and low concentrations).
8. In future dust sampling, it would be helpful to collect information regarding smoking habits of the inhabitants, or other habits that may contribute to metals loading within dust. Cigarette smoke contains cadmium. Collection of information on age of the home, and the length of time the current resident has lived in the home may also be helpful.

Thank you for the opportunity to comment on this report. I had provided these comments in an unsigned version and via e-mail on May 5, 1999. I apologize for my delay in forwarding this signed version, which is slightly modified. If you have any questions, please contact me at 303-285-4065.

Sincerely,



Celia VanDerLoop

Cc: VB/I70 file
Mel Munoz – COPEEN
David Mellard - ATSDR

Barbara O'Grady – CDPHE
Bob Litle – Asarco